UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 18510

CSAH NO. 6

OVER THE

DAGGETT CHANNEL

DISTRICT 3 – CROW WING COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 18510, Piers 1 and 2, were found to be in good condition with no defects of structural significance at this time. The piles exhibited coating failure from up to 9 inches above the waterline to the channel bottom with up to 30% of the surface area covered by rust nodules that exhibited 1/2 to 1 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss related to the corrosion. The channel bottom around the substructure units appeared stable with no significant scour or other channel bottom deficiencies.

INSPECTION FINDINGS:

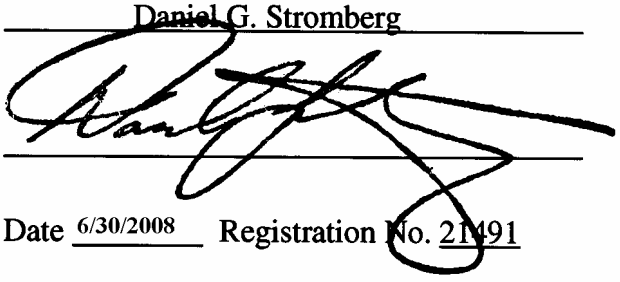
(A) The piles of Piers 1 and 2 exhibited coating loss from approximately a maximum of 9 inches above the waterline to the channel bottom with up to 30% of the surface area covered with rust nodules that exhibited ½ to 1 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss up to 1/32 inch deep as a result of the present extent of corrosion.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

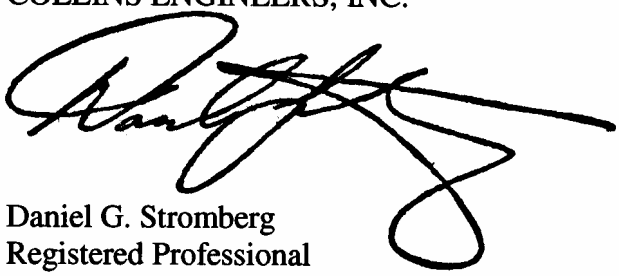
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 18510

Feature Crossed: Daggett Channel

Feature Carried: CSAH No. 6

Location: District 3 – Crow Wing County

Bridge Description: The superstructure consists of three spans of multiple concrete beams. The superstructure is supported by two reinforced concrete abutments and two steel pipe pile bent piers. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 15, 2007

Weather Conditions: Partly Cloudy, 48°F

Underwater Visibility: 5.0 feet

Waterway Velocity: Negligible / None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Piers 1 and 2 consist of a single line of 15 steel pipe piles supporting a reinforced concrete cap. Each abutment is an open abutment with a concrete slope wall.

Maximum Water Depth at Substructure Inspected: Approximately 9.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the upstream end of Pier 2.

Water Surface: The waterline was approximately 9.5 feet below reference.
Assumed Waterline Elevation = 90.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

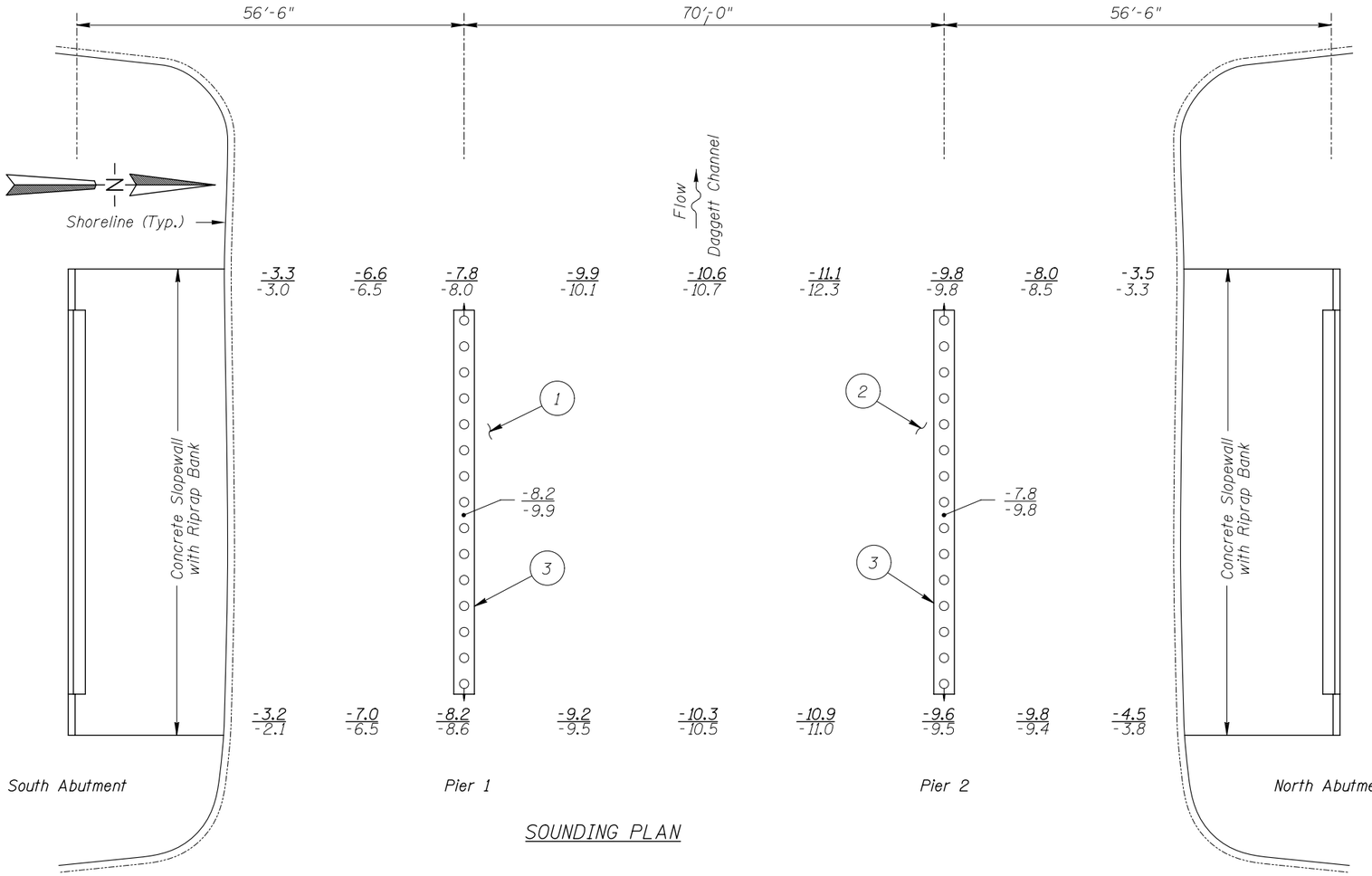
_____ Yes X No

Photograph 1. Overall View of the Structure, Looking Northwest.

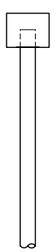
Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking Southeast.

Photograph 4. Piles 1, 2, and 3 at the upstream end (East side) of Pier 1, Looking North.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 15, 2007, the waterline was located approximately 9.5 feet below the top of the pile cap at the upstream end of Pier 2. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 90.5.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom around Pier 1 consisted of sand with with 6 to 8 inches of probe rod penetration.

(2) The channel bottom around Pier 2 consisted of sand and 6- to 8-inch-diameter cobbles with 6 to 8 inches of probe rod penetration.

(3) Piers 1 and 2 exhibited coating failure and surface corrosion from a maximum of approximately 9 inches above the waterline to the channel bottom on approximately 30 percent of the surface area with 1/2-inch to 1.5-inch-diameter rust nodules and minimal section loss with pitting up to 1/32 inches deep.

Legend

-5.2	Sounding Depth (10/15/07)
-5.2	Sounding Depth (9/26/02)
○	Steel Pipe, Cast-in-place Concrete Pile
○	Battered Steel Pipe, Cast-in-place Concrete Pile

Note:

All soundings based on 2007 waterline location.

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UNDERWATER BRIDGE INSPECTION

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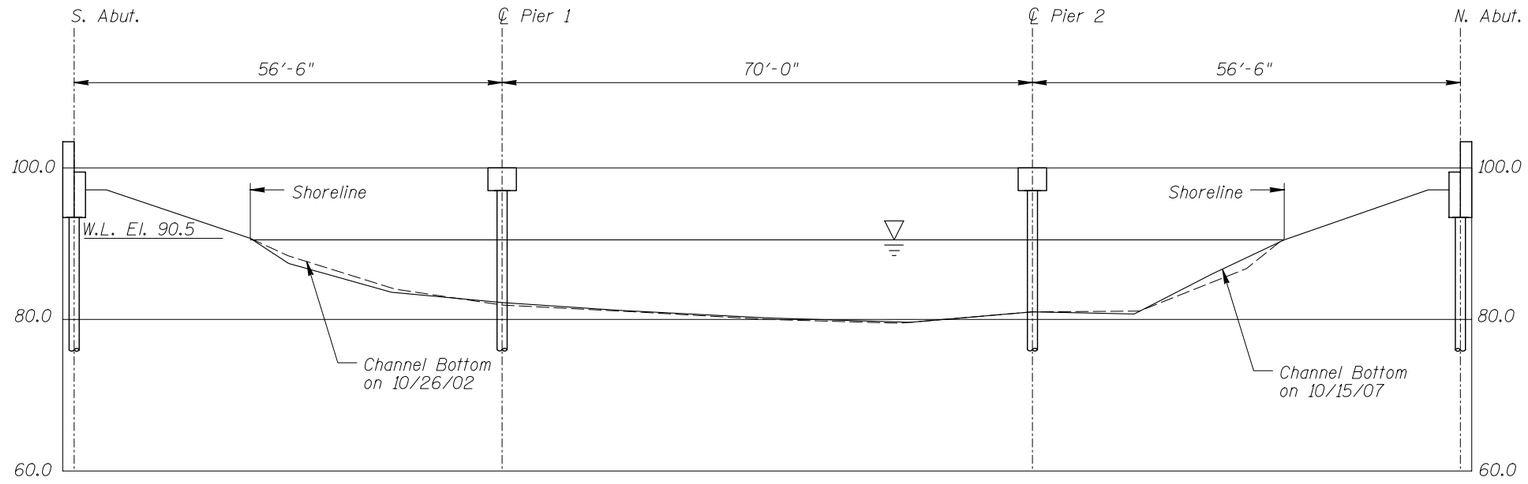
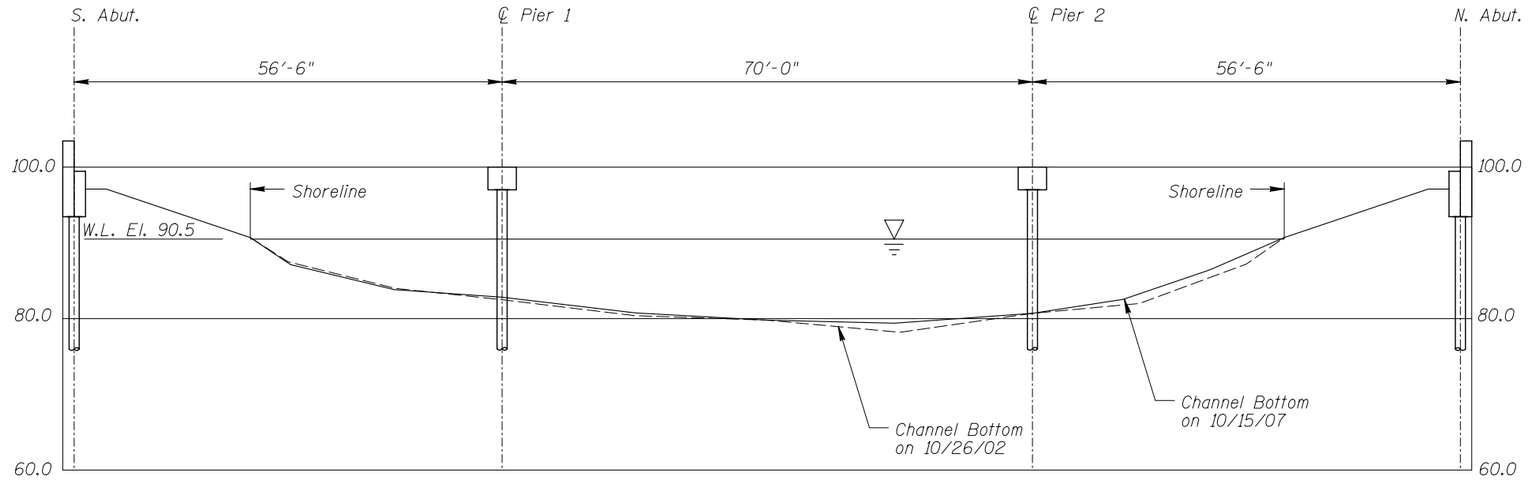
DISTRICT 3, CROW WING COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: MDK	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: DGS		Scale: NTS
Code: 522118510		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: MDK	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: DGS		Scale: 1"=20'
Code: 522118510		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 15, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 18510 WEATHER: Partly Cloudy, 48°F

WATERWAY CROSSED: Daggett Channel

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 9:50 a.m.

TIME OUT OF WATER: 10:20 a.m.

WATERWAY DATA: VELOCITY Negligible / None

VISIBILITY 5.0 feet

DEPTH 9.8 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from up to 9 inches above the waterline to the channel bottom with up to 30 percent of the surface area covered by rust nodules that exhibited 1/2 to 1 1/2 inches maximum diameter. The piles exhibited only minor pitting (up to 1/32 inch deep) and minimal section loss related to the corrosion. No channel bottom deficiencies were encountered.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 18510
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Daggett Channel

INSPECTION DATE October 15, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	8.2’	7	N	N	9	N	7	8	8	8	N	8	N	7	N	7	N	N
	Pier 2	9.8’	7	N	N	9	N	7	8	8	8	N	8	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from up to 9 inches above the waterline to the channel bottom with up to 30 percent of the surface area covered by rust nodules that exhibited 1/2 to 1 1/2 inches maximum diameter. The piles exhibited only minor pitting (up to 1/32 inch deep) and minimal section loss related to the corrosion. No channel bottom deficiencies were encountered.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.